

REMARKS

Claims 22-25, 28-41, and 43-47 are pending in the application; claims 1-21 have been canceled by preliminary amendment; claims 26, 27, and 42 are being cancelled with the instant amendment.

Specification

The disclosure is objected to because of informalities: the examiner points to garbled language in the 3rd paragraph of page 2. This error has been corrected.

Rejection under 35 U.S.C. 103

Claims 22-27, 30-42, and 45-47 stand rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of US 5,337,323 or JP 2001/347388A.

Claim 22 has been amended by including features of claims 26 and 27. Claim 22 now defines that the first and second pulse modulations are in a variably controlled phase relationship relative to one another and the phase relationship is controlled as a function of one or several process parameters and/or as a function of sensor signals.

Claim 37 has been amended to include features of claim 42. Claim 37 now defines that the device for hybrid processing has also input devices for process parameters; sensors for process results in the form of sensor signals; wherein the input devices and the sensors control a phase relationship of the pulse modulations as a function of the process parameters and/or as a function of the sensor signals.

AAPA discloses that it is known in the art to employ hybrid processes, i.e., to couple, for example, laser beam welding and metal inert gas welding (MIG) - see page 1 to page 2, 3rd paragraph, of the specification. It is also disclosed that pulse modulation is used in connection with various types of machining (in connection with cutting tools, waterjets, electric beams etc.) for controlling radiation, electric arc, plasma etc. The various advantages achieved by pulse modulation - referring to the individual processes - are presented in the list bridging pages 2 and 3. The various disadvantages that are encountered when employing hybrid methods are discussed in the last full paragraph of page 3 and the paragraph bridging pages 3 and 4.

Thus, hybrid processes are known; pulse modulation of individual processes is known. However, it is not known to employ pulse modulation in all of the individual

processes combined to a hybrid process and to control the pulse modulations of the individual processes in a variably controlled phase relationship relative to one another in that the phase relationship is controlled as a function of one or several process parameters and/or as a function of sensor signals. The individual processes are inventively coupled to one another to allow electronic adjustment of the individual processes so as to optimize the processing result; see page 12 of the specification.

US 5,337,323 discloses a master/slave control of a laser array for stabilizing the light output of each individual laser element. The output of the master semiconductor is sensed by a photodiode and a photocurrent is generated. Fluctuations of the photocurrent are corrected by a master bias current control. The slave semiconductors are controlled by a slave bias current control that is triggered by the output of the master bias current control. Basically, the output of the master semiconductor is monitored and when fluctuations occur the master is corrected and at the same time the slave semiconductors are corrected in the same way. This reference only teaches that in a group of same devices it is sufficient to select one device and correct the operation of all the others based on the operating condition of the selected device so that a stabilized light output is provided accordingly.

The situation is quite different in hybrid processes since two or more individual machining processes that are based on different operating principles and produce different "output" are to be controlled such that the effects caused by the different processes actually can be combined in a useful way. For example, hybrid processing may require alternating activation of the individual processes or a simultaneous activation of the individual processes but for different durations etc. See page 9, last three paragraphs, of the specification. A person faced with the problem of properly controlling a hybrid process combining different machining methods based on different and often conflicting principles would not look at the device of US 5,337,323 where simply the light output of the master is used to adjust the light output of identical slaves. There is no motivation to employ such an output "alignment" in a hybrid process.

JP 2001/347388 discloses laser beam machining by two UV laser beams that are synchronized with one another. A control of the phase relationship based on feedback type control (sensor signals) or on process parameters is not disclosed.

Reconsideration and withdrawal of the rejection of the claims 22-27, 30-42, and 45-47 pursuant to 35 USC 103 are therefore respectfully requested.

Claims 28 and 29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of US 5,337,323 and JP 2001/347388A as well as US 4,817,106 - since the examiner also refers to the rejection of claim 37 in view of AAPA / US 5,337,323 / JP 2001/347388A, it is assumed that the rejection also applies to claims 43, 44 dealing antiphase and in-phase operation.

Claims 28 and 29 are believed to be allowable as dependent claims of claim 22.

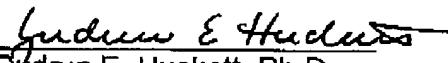
CONCLUSION

In view of the foregoing, it is submitted that this application is now in condition for allowance and such allowance is respectfully solicited.

Should the Examiner have any further objections or suggestions, the undersigned would appreciate a phone call or e-mail from the examiner to discuss appropriate amendments to place the application into condition for allowance.

Authorization is herewith given to charge any fees or any shortages in any fees required during prosecution of this application and not paid by other means to Patent and Trademark Office deposit account 50-1199.

Respectfully submitted on March 17, 2006,


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Encl.: time extension petition (1 sheet)

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